

**REQUEST TO REDESIGNATE  
Bullitt, Oldham, and Jefferson Counties,  
Kentucky  
LOCATED WITHIN THE**

**LOUISVILLE, KY-IN, MSA  
8-HOUR OZONE NONATTAINMENT AREA**



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## INTRODUCTION

The Louisville, Kentucky-Indiana, Metropolitan Statistical Area (MSA) was designated in a *Federal Register* notice on April 30, 2004 (*Appendix A*), as a nonattainment area for the 8-hour ozone National Ambient Air Quality Standard (NAAQS), effective June 15, 2004. The Commonwealth of Kentucky requests that the United States Environmental Protection Agency (U.S. EPA) redesignate the Bullitt, Oldham, and Jefferson Counties, Kentucky, portion of the Louisville, KY-IN MSA to attainment for the 8-hour ozone standard pursuant to 107 (d)(3) of the 1990 Clean Air Act Amendments (CAAA). The MSA consists of Bullitt, Oldham, and Jefferson Counties, Kentucky and Clark and Floyd Counties, Indiana. The state of Indiana is separately submitting a request that the Indiana portion of this nonattainment area be redesignated to attainment.

In accordance with section 110(k) of the Clean Air Act Amendments of 1990, Kentucky's request to amend the State Implementation Plan (SIP) is based on the most recent three years of monitoring data showing no additional violations of the 8-hour ozone standard for the 2003-2005 time period, and a calculated ozone design value for 2003-2005 data that is attaining the NAAQS. Permanent and enforceable reductions in ozone precursor emissions have occurred; and emission projections demonstrate that the 2003 attainment year emission levels in this area will not be exceeded during the next 14 years.

This redesignation request was prepared in accordance with U.S. EPA Guidance issued in 1992, in memorandums on June 23 and September 4 from John Calcagni, and additional guidance provided by memorandum on September 17, 1993, from Michael H. Shapiro (*Appendix B*).

## **BACKGROUND**

The Clean Air Act Amendments of 1990 (CAAA) establishes a process for air quality management through the NAAQS. Area designations are required after promulgation of a new or revised NAAQS. On July 18, 1997, U.S. EPA promulgated a revised ozone standard of 0.08 parts per million (ppm), measured over an 8-hour period. The 8-hour standard is more protective of public health and more stringent than the previous 1-hour standard. The NAAQS rule was challenged by numerous litigants and in May 1999, the U.S. Court of Appeals for the D.C. Circuit issued a decision remanding, but not vacating, the 8-hour standard. Among other things, the Court recognized that U.S. EPA is required to designate areas for any new or revised NAAQS in accordance with the CAA and addressed a number of other issues, which are not related to designations.

In February 2001, the Supreme Court upheld U.S. EPA authority to set the NAAQS and remanded the case back to the D.C. Circuit for disposition of issues the Court did not address in its initial decision. The Supreme Court also remanded the 8-hour implementation strategy to U.S. EPA. In March 2002, the D.C. Circuit rejected all remaining challenges to the 8-hour ozone standard.

The process for designations following promulgation of a NAAQS is contained in section 107(d)(1) of the CAA. The Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21) extended by 1 year the time for U.S. EPA to designate areas for the 8-hour NAAQS. Thus, U.S. EPA was required to designate areas for the revised ozone standard by July 2000. However, U.S. EPA's appropriations bill in 2000 restricted the agency's authority to spend money or designate areas

until June 2001 or the date of the Supreme Court ruling on the standard, whichever came first. As noted earlier, the Supreme Court decision was issued in February 2001.

In 2003, several environmental groups filed suit in district court claiming U.S. EPA had not met its statutory obligation to designate areas for the 8-hour NAAQS. U.S. EPA entered into a consent decree, which required U.S. EPA to issue the designations by April 15, 2004. In accordance with Section 107(d)(1) of the CAAA, a *Federal Register* notice published on April 30, 2004, designated the Louisville Kentucky and Indiana MSA to be nonattainment for the 8-hour ozone NAAQS, effective June 15, 2004 (*Appendix A*).

## **IMPROVEMENT IN AIR QUALITY**

The 8-hour ozone nonattainment designation was based on air quality data collected from 2001 through 2003 that exceeded the specified NAAQS level of 0.08 parts per million (ppm). In 2005 the ambient ozone data for Bullitt, Jefferson, and Oldham Counties in the Kentucky portion of the nonattainment area and the nonattainment portion of Indiana indicated no further exceedances of the 8-hour standard and resulted in a decline in the design value for the most recent three-year period (2003-2004-2005). The ambient data is included in *Appendix C*.

Table 1 is a summary of the number of days annually in which the 8-hour NAAQS for ozone (0.08 parts per million) was exceeded in Bullitt, Jefferson, and Oldham Counties, Kentucky, and Clark and Floyd Counties, Indiana. The overall trend is downward in numbers of exceedances that occur annually. A map indicating the location of the seven ozone monitors in the Louisville 8-hour nonattainment area is included in *Appendix K*.

**TABLE 1**  
**SUMMARY OF 8-HOUR OZONE EXCEEDANCES THAT OCCURRED ANNUALLY**

<b>Monitor</b>	<b>County</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Charlestown, IN	Clark	17	4	0	3
New Albany, IN	Floyd	13	4	0	2
WLKY, KY	Jefferson	7	0	0	1
Watson, KY	Jefferson	15	0	0	4
Bates, KY	Jefferson	4	1	1	0
Shepherdsville, KY	Bullitt	10	0	1	0
Buckner, KY	Oldham	12	2	0	4

The table below is a summary of the annual 4<sup>th</sup> maximum value for the 8-hour ozone NAAQS for Bullitt, Jefferson, and Oldham Counties, Kentucky, and Clark and Floyd Counties, Indiana. This data defines the design values for monitors in the region.

**Table 2**  
**ANNUAL 4<sup>TH</sup> MAXIMUM HIGH TREND FOR 8-HOUR OZONE (PARTS PER MILLION)**

<b>Monitor</b>	<b>County</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Design Value</b>
Charlestown, IN	Clark	0.100	0.090	0.074	0.080	0.081
New Albany, IN	Floyd	0.097	0.086	0.071	0.080	0.079
WLKY, KY	Jefferson	0.088	0.073	0.068	0.074	0.071
Watson, KY	Jefferson	0.096	0.075	0.070	0.085	0.076
Bates, KY	Jefferson	0.085	0.072	0.070	0.079	0.073
Shepherdsville, KY	Bullitt	0.091	0.072	0.068	0.080	0.073
Buckner, KY	Oldham	0.091	0.082	0.076	0.089	0.082

The data collected by Kentucky was quality assured in accordance with 40 CFR 58 and was recorded in the U.S. EPA Air Quality System (AQS). It is anticipated that these monitors, operated by Jefferson County personnel and Division of Air Quality field staff, will remain at current locations for the foreseeable future.

For this SIP revision, Kentucky first had to develop a Baseline Emissions Inventory for this newly designated nonattainment area. The year 2002 was chosen as the base year for developing a comprehensive ozone precursor emissions inventory for which projected emissions could be developed for 2003, 2005, 2008, 2011, 2014, 2017, and 2020. Kentucky chose 2003 as the attainment year because this is the most current inventory data available for all jurisdictions in the metro area. This inventory is included in *Appendix D*. The three-year period (2003-2005) brings the design value into attainment for each county, with a calculated value at each monitor well below the 0.085 ppm NAAQS. The AQS ambient data for ozone is included in *Appendix C*.

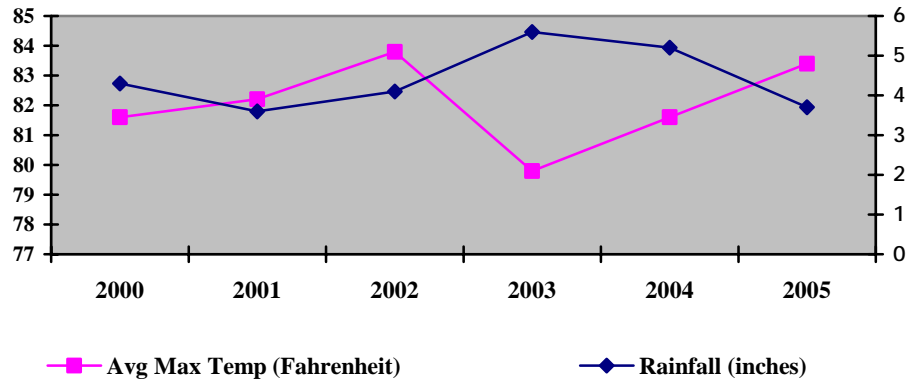
## **PERMANENT AND ENFORCEABLE EMISSION REDUCTIONS**

The improvement in air quality in the Louisville, KY-IN, MSA ozone nonattainment area, as verified by the lower design value, is due to the implementation of permanent and enforceable emission reductions. Certainly the overall favorable pattern of weather conditions (Graph 1) contributed to the lower levels of ozone formations; however, Kentucky is able to identify significant permanent and enforceable reductions that occurred as well during this timeframe of 2002-2005.

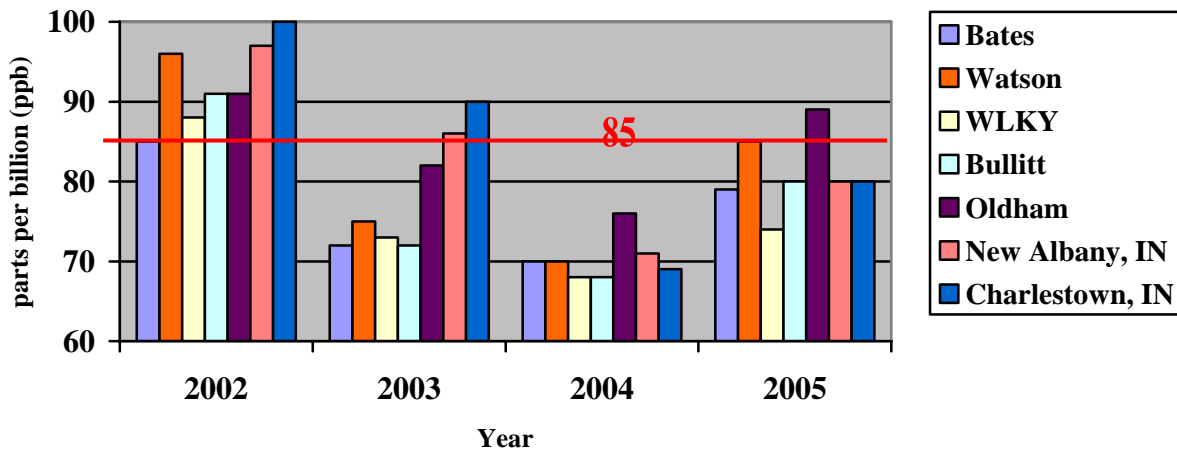
General meteorological information regarding temperatures and rainfall for years 2000 through 2005 is depicted in Graph 1. This information is representative of the months of May through September, the months with typically high ozone levels in Kentucky. Over the last three years, the average maximum temperature has climbed while precipitation has fallen. As well, the overall 8-hour ozone design value over the last three years has fallen.



**Graph 1. Jefferson County, Kentucky, Average Maximum Temperature & Average Rainfall (Annually for May through September)**



**Graph 2. Annual 4th Max High Trend for 8-Hour Ozone**



Emission reductions (in tons per day, or tpd) described below are from various programs and initiatives. The following categories of sources have shown or are expected to show emission reductions in volatile organic compounds (VOCs), carbon monoxide (CO), and oxides of nitrogen (NOx) emissions due to regulatory measures implemented, both by the U.S. EPA and the Commonwealth of Kentucky.

For this SIP revision, Kentucky chose to use 2002 as the base year for developing a comprehensive ozone precursor emissions inventory for which certain projected emissions could be developed for 2003, 2005, 2008, 2011, 2014, 2017, and 2020. Kentucky chose 2003 as the attainment year because this is the most current inventory data available for all jurisdictions in the metro area, and which, added then to the three-year period (2003-2005), brings the design value into attainment at each monitor, with a calculated value much less than the 0.085 ppm required by the NAAQS.

## **2002-2005 EMISSION REDUCTION PROGRAMS**

The following information outlines emission reduction measures that have occurred from 2002 through 2005.

### **HIGHWAY MOBILE SOURCE REDUCTIONS**

#### ***Federal Motor Vehicle Control Programs (FMVCP)***

Permanent and enforceable reductions have been and continue to be achieved each year through this program. In recent years, stricter federal requirements have been imposed on automobile manufacturers for improved fuel-efficiency and extended warranties for emission control devices. Documentation of these emission reductions is contained in the highway mobile modeling runs (*Appendix E*).

#### ***Fleet Turnover of Automobiles***

Permanent and enforceable emission reductions have occurred in the Louisville, KY-IN, MSA nonattainment area as a result of fleet turnover of automobiles. As older, less efficient automobiles are replaced by newer, more efficient models, there is a reduction of emissions on a

per mile basis. Quantification of these reductions is contained in the highway mobile modeling runs (*Appendix E*).

### ***Tier 2 Vehicle Emissions and Fuel Standards***

Permanent and enforceable reductions will occur through this program. The overall Tier 2 program focuses on reducing the passenger car and light truck emissions most responsible for causing ozone. In 2004, the Tier 2 standards began to phase in for the first time a single set of federal tailpipe emission standards that apply to all passenger cars, light trucks, and larger passenger vehicles (including sport utility vehicles, minivans, vans, and pickup trucks) operated on any fuel. In 2007, when the new standards will be fully phased in, U.S. EPA projects that nationwide NO<sub>x</sub> reductions from cars and trucks will be 856,471 tons per year (tpy). U.S. EPA further projects a NO<sub>x</sub> reduction of 1,236,000 tpy by 2010, and reductions reaching an estimated 2,220,000 tpy in 2020. Quantification of these reductions for Kentucky is contained in the highway mobile model runs (*Appendix E*).

### ***Heavy-Duty Engine, Vehicle and Fuel Standards***

Permanent and enforceable reductions will occur through this program. This program will result in particulate matter and NO<sub>x</sub> emission levels that are 90 percent and 95 percent below the standard levels in effect today, respectively. The rule mandates a 97 percent reduction in the sulfur content of diesel fuel. Additionally, the cap for sulfur in regular gasoline will be reduced to 80 ppm and most refineries must produce gasoline averaging no more than 30 ppm sulfur in 2006. Quantification of these reductions is contained in the highway mobile modeling runs (*Appendix E*).

## **POINT SOURCE EMISSION REDUCTIONS**

### ***Reasonably Available Control Measures (RACM)***

401 KAR 51:012, Section 1 (2) requires that all major air contaminant sources shall as a minimum apply control procedures that are reasonable, available, and practical.” See *Appendix F* for the full text of 401 KAR 50:012.

### ***Maximum Available Control Technology (MACT)***

The Clean Air Act requires U.S. EPA to review and update its lists of categories of industries that emit one or more of 187 listed toxic air pollutants, or Hazardous Air Pollutants (HAPS). For listed categories of major industrial sources, the law requires U.S. EPA to develop standards requiring those industries to achieve emission reductions equivalent to putting into place what is known as “maximum achievable control technology” (MACT). Many of the HAPS under these industrial categories of controls are also VOCs, and compliance with these new MACT standards as they are being promulgated will decrease VOC emissions from the affected industries. Additionally, U.S. EPA is now promulgating residual risk requirements of some point and area source categories. These requirements will further reduce VOC emissions.

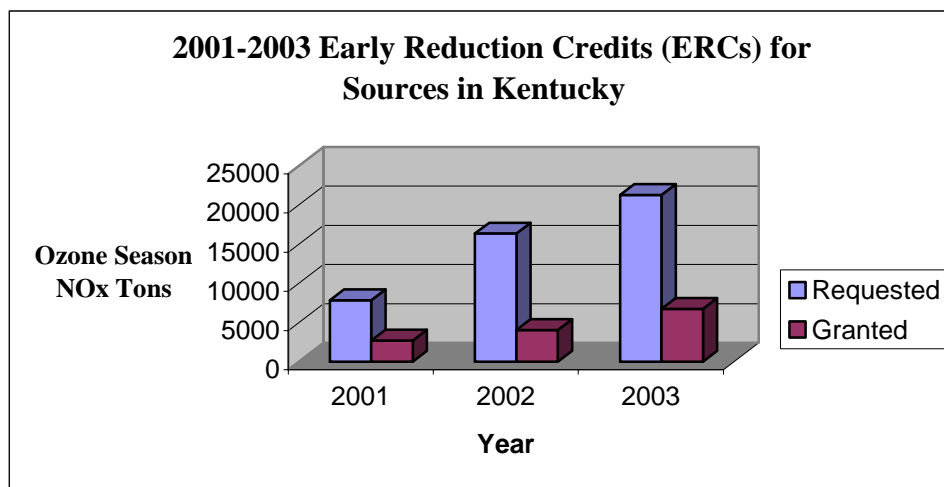
### ***Additional Reductions - NO<sub>x</sub> SIP Call Reductions***

Although Kentucky is not claiming credit for these source reductions regarding the attainment status of the county, it is important to note ongoing and significant declining emission trends of ozone precursors (i.e., NO<sub>x</sub>) that occurred during the current 2002-2004 years of ozone monitoring data.

The NO<sub>x</sub> emission reductions achieved from the NO<sub>x</sub> SIP Call throughout the entire region and the state of Kentucky, effective May 2004, will contribute to the area's continued maintenance of the 8-hour ozone standard and future compliance with the ozone NAAQS.

In accordance with Kentucky regulation 401 KAR 51:180, the Division had determined from Kentucky's compliance supplement pool that electric-generating units (EGUs) had 13,469 tons NO<sub>x</sub> available for Early Reduction Credits (ERCs). Of the 13,469 tons NO<sub>x</sub> for EGUs, 20% (2,694) was available for emission reductions achieved in 2001, 30% (4,041) was available for emission reductions achieved in 2002, and the remaining 50% (6,734) was available for emission reductions in 2003. Per 401 KAR 51:180, the ERCs were used for compliance with NO<sub>x</sub> emission standards in 401 KAR 51:160 during the 2004 and 2005 control period. However, overall the sources in each year, requested allowances for a much larger number of ozone season NO<sub>x</sub> tons reductions. Referring to the graph below, you can compare the annual source reductions to the allowances actually available under the NO<sub>x</sub> SIP Call. These reductions benefited the nonattainment area and demonstrate on-going NO<sub>x</sub> emission reductions throughout the state.

**Graph 3**



#### **AREA SOURCE CONTROLS**

The Division's open burning regulation (*Appendix F*) to limit burning activities in those counties designated nonattainment applies in the former 1-Hour Ozone Maintenance areas in Bullitt and Oldham counties.

#### **NON-HIGHWAY MOBILE SOURCE REDUCTIONS**

Until the mid-1990s, emissions from non-highway engines were largely uncontrolled. The non-highway category includes outdoor power equipment, recreational vehicles (ie., scooters, mopeds, all-terrain bikes, snowmobiles, etc.), marine vessels, personal watercraft, farm and construction machinery, lawn and garden equipment, locomotives, and many other applications. Certain federal rules have been implemented since the early 1990's that have resulted in permanent and enforceable emission reductions from these nonroad sources.

***Implemented during the 2002-2004 timeframe were:***

***Small spark-ignition engines*** – This set of emissions standards for handheld applications (such as leaf blowers and chainsaws) phases in 2002 – 2007 and will result in an additional 70 percent reduction in hydrocarbons and NO<sub>x</sub>.

***Large spark-ignition engines*** – In 2004, these emission standards phased in to reduce NO<sub>x</sub> and CO for many applications of industrial equipment, including forklifts, airport service equipment, generators, compressors, and welders.

***Locomotives*** – The Tier 1 emissions standards apply to locomotives and locomotive engines manufactured from 2002 through 2004, and will reduce NO<sub>x</sub> emissions by two thirds as new engines are placed in service.

***Land-based diesel engines*** – More stringent standards to reduce NO<sub>x</sub> emissions apply to all engine sizes and are being phased in between 2001 – 2006. Included in this change is construction equipment such as backhoes, agricultural equipment such as tractors, material handling equipment such as heavy forklifts, industrial equipment such as airport service vehicles, and utility equipment such as generators and pumps.

These reductions were determined using the U.S. EPA's nonroad model and are reflected in the emissions provided in this document (*Appendix G*).

## **MAINTENANCE PLAN**

Section 107(d)(3)(e) of the Clean Air Act Amendments of 1990 (CAAA) mandates that for an area to be redesignated to attainment, the U.S. EPA must approve a maintenance plan that meets the requirements of Section 175A. The maintenance plan must constitute a SIP revision and

provide for maintenance of the air quality in an affected area for at least 10 years after redesignation. Kentucky has chosen to project emissions through the year 2020, which is 14 years after attainment.

The maintenance plan includes: an emissions inventory for the base year (2002); projected inventories for the attainment year 2003, interim years 2005, 2008, 2011, 2014, 2017, and the end year 2020; a commitment to maintain the existing ambient monitoring system; and contingency measures that may be put in place should the area have subsequent violations of the 8-hour ozone standard.

## **2002 BASE YEAR EMISSIONS INVENTORY**

Since this is a newly designated nonattainment area, a base year inventory had not yet been submitted to U.S. EPA. A Base Year Emissions Inventory for 2002 for Bullitt, Oldham, and Jefferson Counties, Kentucky, in the Louisville, KY-IN, 8-Hour Ozone Nonattainment Area is being submitted to the U.S. EPA (*Appendix D*). Documentation of the methodologies of the development of this inventory is also included in that appendix.

Kentucky believes the inventory submitted in this document to be a comprehensive inventory of actual emissions for the Kentucky portion of the area and the best basis for which to make any future projections. The 2002 base year maintenance area emissions inventory methodology and documentation is included as *Appendix D*.



## **EMISSION PROJECTION METHODOLOGY**

One of the planning elements listed in the Calcagni memorandum from September 1992 (*Appendix B*) that is required for attainment redesignation purposes is developing a projection inventory that indicates the area will remain in attainment and which includes emission projections for at least ten years after U.S. EPA's official redesignation approval. Kentucky's projection inventory through the year 2020, and the methodology for performing that inventory, is located in *Appendix H*.

The attainment year for Bullitt, Oldham, and Jefferson Counties is 2003. Kentucky used actual 2003 emissions for point sources. The inventory projected both the area source emissions and the locomotive portion of non-highway emissions from the 2002 Base Year Inventory to the 2003 attainment year. Emissions for the base year, the attainment year, and all interim years for highway mobile were developed using U.S. EPA's MOBILE6.2 mobile emissions model. Nonroad emissions were modeled using U.S. EPA's Nonroad Emissions Model for 2003. The emissions inventory thus developed for 2003 was used to project emissions for the interim years.

A maintenance demonstration requires comparison of the projected emissions inventory with the baseline inventory. If the projected emissions remain at or below the baseline emissions, there is a demonstration of maintenance. If, however, the projected emissions are above the baseline, then additional measures are required to ensure the projected emissions will remain at or below the baseline emissions.

Tables detailing the category projection inventories for VOC, CO, and NO<sub>x</sub> emissions for the attainment year 2003, and years 2005, 2008, 2011, 2014, 2017, and 2020 are included for Bullitt and Oldham Counties in *Appendix H*. Biogenic emissions have been excluded from these projection tables. Biogenic emissions for the base year 2002 can be found in *Appendix D*. Based on information received from EPA, biogenic emissions are expected to remain stable throughout the projection period.

Tables 3 through 9 show the projection of emissions through 2020. Bullitt, Oldham and Jefferson Counties' projected 2020 total emissions for both VOC and NO<sub>x</sub> are below the 2003 total emissions, thus demonstrating continued maintenance of the 8-hour ozone standard.

Table 4 and the carbon monoxide portion of Table 6 are not used to set budgets, but are included for informational purposes only.

**TABLE 3**  
**BULLITT, OLDHAM, AND JEFFERSON COUNTIES 8-HOUR OZONE MAINTENANCE AREA**  
**PROJECTED VOC EMISSIONS**  
**(TONS PER DAY)**  
**2003-2020**

<b>Categories</b>	<b>2003</b>	<b>2005</b>	<b>2008</b>	<b>2011</b>	<b>2014</b>	<b>2017</b>	<b>2020</b>
<b>Point</b>							
<b>Bullitt</b>	8.10	8.21	8.39	8.58	8.77	8.95	9.16
<b>Oldham</b>	0.72	0.73	0.75	0.76	0.78	0.79	0.81
<b>Jefferson</b>	23.63	23.62	23.55	23.33	23.15	22.96	22.74
<b>Point Subtotal</b>	<b>32.45</b>	<b>32.56</b>	<b>32.69</b>	<b>32.67</b>	<b>32.70</b>	<b>32.70</b>	<b>32.71</b>
<b>Area</b>							
<b>Bullitt</b>	3.34	3.43	3.60	3.75	3.92	4.09	4.26
<b>Oldham</b>	2.46	2.55	2.70	2.82	3.01	3.16	3.32
<b>Jefferson</b>	17.33	17.41	17.51	17.59	17.67	17.76	17.85
<b>Area Subtotal</b>	<b>23.13</b>	<b>23.39</b>	<b>23.81</b>	<b>24.16</b>	<b>24.60</b>	<b>25.01</b>	<b>25.43</b>
<b>Mobile*</b>							
<b>Bullitt</b>	3.74	3.43	2.87	2.52	2.30	2.18	2.05
<b>Oldham</b>	2.29	2.16	1.79	1.56	1.45	1.40	1.34
<b>Jefferson</b>	25.34	23.04	19.22	15.49	12.24	10.52	9.52
<b>Mobile Subtotal</b>	<b>31.37</b>	<b>28.63</b>	<b>23.88</b>	<b>19.57</b>	<b>15.99</b>	<b>14.10</b>	<b>12.91</b>
<b>Nonroad</b>							
<b>Bullitt</b>	1.77	1.91	1.91	1.82	1.69	1.49	1.36
<b>Oldham</b>	1.54	1.38	1.18	1.08	1.06	1.06	1.08
<b>Jefferson</b>	14.31	13.14	11.50	10.62	10.41	10.45	10.64
<b>Nonroad Subtotal</b>	<b>17.62</b>	<b>16.43</b>	<b>14.59</b>	<b>13.52</b>	<b>13.16</b>	<b>13.00</b>	<b>13.08</b>
<b>Total</b>	<b>104.57</b>	<b>101.01</b>	<b>94.97</b>	<b>89.92</b>	<b>86.45</b>	<b>84.81</b>	<b>84.13</b>

\*Calculated using MOBILE 6.2

**TABLE 4**  
**BULLITT, OLDHAM, AND JEFFERSON COUNTIES 8-HOUR OZONE MAINTENANCE AREA**  
**PROJECTED CO EMISSIONS**  
**(TONS PER DAY)**  
**2003-2020**

<b>Categories</b>	<b>2003</b>	<b>2005</b>	<b>2008</b>	<b>2011</b>	<b>2014</b>	<b>2017</b>	<b>2020</b>
<b>Point</b>							
<b>Bullitt</b>	0.20	0.20	0.21	0.21	0.23	0.24	0.24
<b>Oldham</b>	0.06	0.06	0.06	0.00	0.07	0.07	0.07
<b>Jefferson</b>	9.83	9.82	9.99	9.79	9.83	9.79	9.53
<b>Point Subtotal</b>	<b>10.09</b>	<b>10.08</b>	<b>10.26</b>	<b>10.00</b>	<b>10.13</b>	<b>10.10</b>	<b>9.84</b>
<b>Area</b>							
<b>Bullitt</b>	1.36	1.41	1.48	1.53	1.59	1.66	1.74
<b>Oldham</b>	0.90	0.94	0.99	1.04	1.10	1.16	1.22
<b>Jefferson</b>	1.13	1.12	1.11	1.09	1.08	1.06	1.05
<b>Area Subtotal</b>	<b>3.39</b>	<b>3.47</b>	<b>3.58</b>	<b>3.66</b>	<b>3.77</b>	<b>3.88</b>	<b>4.01</b>
<b>Mobile*</b>							
<b>Bullitt</b>	45.64	40.37	33.54	30.66	29.80	30.18	31.18
<b>Oldham</b>	26.93	24.58	20.23	18.47	18.23	18.70	19.55
<b>Jefferson</b>	311.52	284.48	227.02	196.93	174.38	162.87	157.46
<b>Mobile Subtotal</b>	<b>384.09</b>	<b>349.43</b>	<b>280.79</b>	<b>246.06</b>	<b>222.41</b>	<b>211.75</b>	<b>208.19</b>
<b>Nonroad</b>							
<b>Bullitt</b>	12.06	12.81	13.63	14.25	14.63	14.96	15.36
<b>Oldham</b>	16.92	17.46	18.10	18.74	19.38	20.11	20.90
<b>Jefferson</b>	191.10	198.34	205.71	211.47	216.99	224.62	233.89
<b>Nonroad Subtotal</b>	<b>220.08</b>	<b>228.61</b>	<b>237.44</b>	<b>244.46</b>	<b>251.00</b>	<b>259.69</b>	<b>270.15</b>
<b>Total</b>	<b>617.65</b>	<b>591.59</b>	<b>532.07</b>	<b>504.18</b>	<b>487.31</b>	<b>485.42</b>	<b>492.19</b>

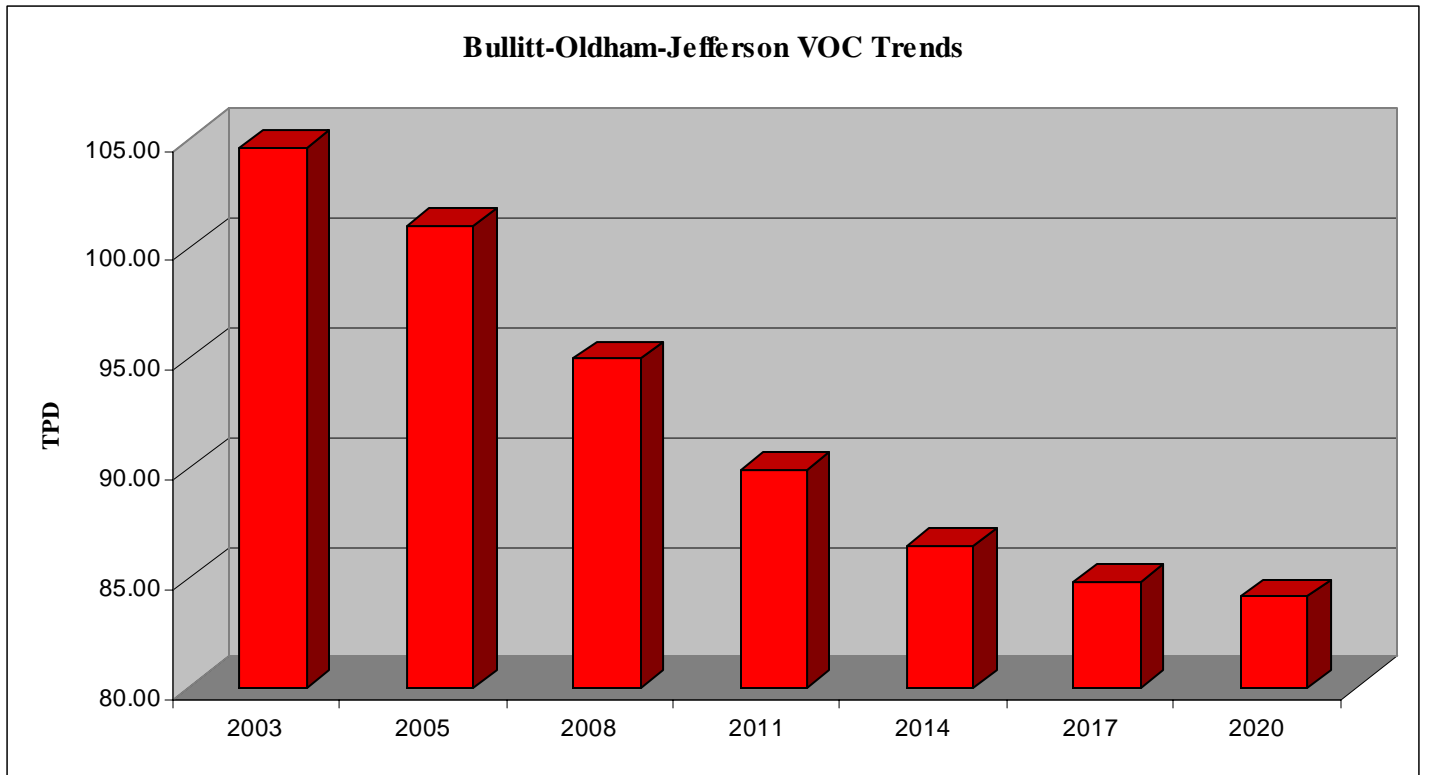
\*Calculated using MOBILE 6.2

**TABLE 5**  
**BULLITT, OLDHAM, AND JEFFERSON COUNTIES 8-HOUR OZONE MAINTENANCE AREA**  
**PROJECTED NOx EMISSIONS**  
**(TONS PER DAY)**  
**2003-2020**

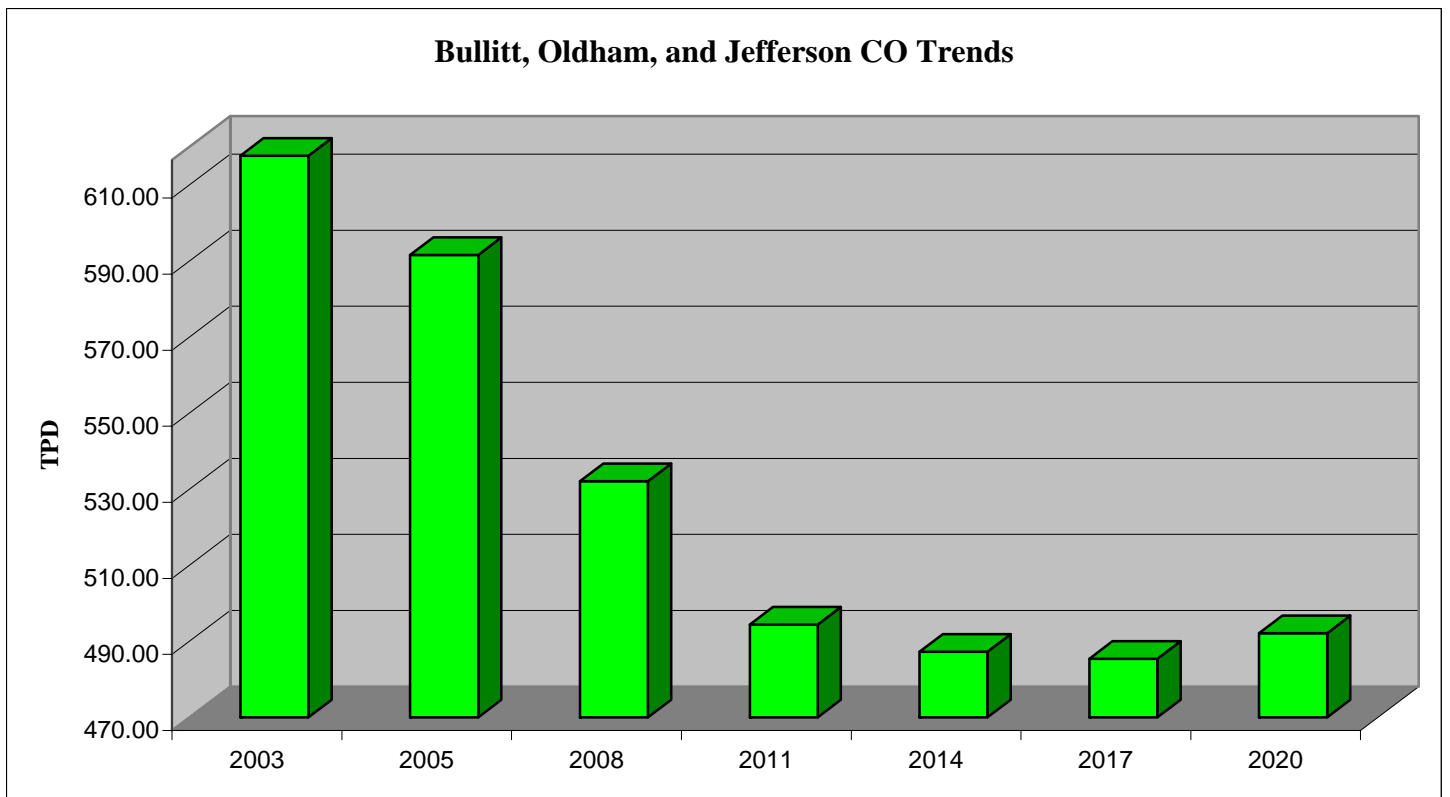
<b>Categories</b>	<b>2003</b>	<b>2005</b>	<b>2008</b>	<b>2011</b>	<b>2014</b>	<b>2017</b>	<b>2020</b>
<b>Point</b>							
<b>Bullitt</b>	0.60	0.61	0.64	0.65	0.68	0.71	0.72
<b>Oldham</b>	0.09	0.09	0.09	0.10	0.10	0.10	0.10
<b>Jefferson</b>	74.78	53.95	53.63	50.91	51.76	51.24	46.49
<b>Point Subtotal</b>	<b>75.47</b>	<b>54.65</b>	<b>54.36</b>	<b>51.66</b>	<b>52.54</b>	<b>52.05</b>	<b>47.31</b>
<b>Area</b>							
<b>Bullitt</b>	0.11	0.11	0.12	0.12	0.13	0.13	0.14
<b>Oldham</b>	0.07	0.07	0.07	0.08	0.09	0.09	0.09
<b>Jefferson</b>	0.75	0.76	0.76	0.76	0.76	0.76	0.76
<b>Area Subtotal</b>	<b>0.93</b>	<b>0.94</b>	<b>0.95</b>	<b>0.96</b>	<b>0.98</b>	<b>0.98</b>	<b>0.99</b>
<b>Mobile*</b>							
<b>Bullitt</b>	7.52	7.23	5.99	4.83	3.84	3.17	2.73
<b>Oldham</b>	4.43	4.36	3.58	2.88	2.34	1.96	1.72
<b>Jefferson</b>	63.29	54.96	41.55	29.62	19.76	13.87	11.02
<b>Mobile Subtotal</b>	<b>75.24</b>	<b>66.55</b>	<b>51.12</b>	<b>37.33</b>	<b>25.94</b>	<b>19.00</b>	<b>15.47</b>
<b>Nonroad</b>							
<b>Bullitt</b>	1.81	1.78	1.70	1.60	1.47	1.35	1.27
<b>Oldham</b>	1.63	1.59	1.49	1.37	1.22	1.07	0.95
<b>Jefferson</b>	31.94	31.11	29.36	27.37	25.26	23.44	22.17
<b>Nonroad Subtotal</b>	<b>35.38</b>	<b>34.48</b>	<b>32.55</b>	<b>30.34</b>	<b>27.95</b>	<b>25.86</b>	<b>24.39</b>
<b>Total</b>	<b>187.02</b>	<b>156.62</b>	<b>138.98</b>	<b>120.29</b>	<b>107.41</b>	<b>97.89</b>	<b>88.16</b>

\*Calculated using MOBILE 6.2

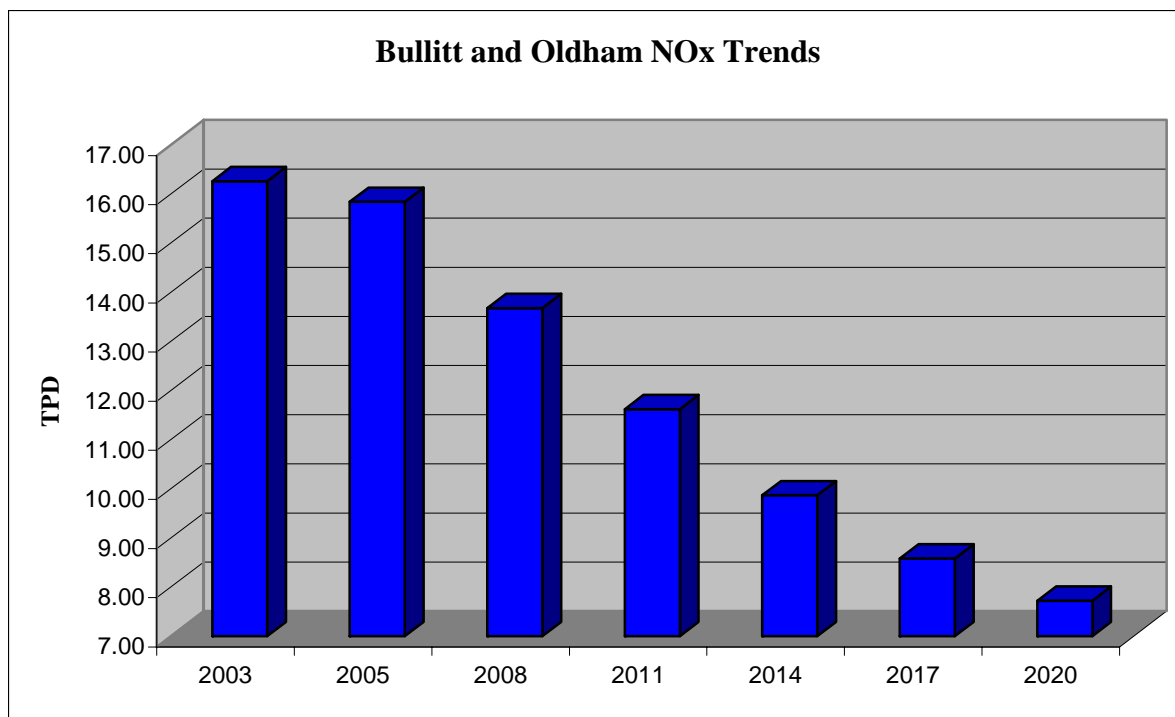
**Graph 4**



**Graph 5**



**Graph 6**



The emissions inventory is broken down into four components: point, area, highway mobile, and non-highway mobile sources. Using 2003 as the attainment year, the subsequent years were chosen at three-year or longer intervals and project maintenance for at least a 10-year period pending approval of the revision of the SIP. Necessary calculations for the projections were made using EXCEL software. A description of how growth factors for each emission category were obtained and used follows. The documentation showing how emissions were grown is included in *Appendix H*.

**Point Source Projections – Bullitt and Oldham Counties**

For this inventory purpose, point sources are defined as stationary sources that emit 10 tons or more per year (tpy) of VOC, or 100 tpy or more of NO<sub>x</sub> or CO. Emissions are calculated from data collected annually from point sources. The 2002 point source information was developed

using the Division's existing emissions inventory database (i.e., TEMPO). The existing TEMPO database was updated using questionnaires and annual surveys completed by the sources and quality assured by division personnel.

Utilizing Standard Industrial Codes (SIC), all point source emission projections were based on growth factors calculated using Bureau of Economic Analysis (BEA) projection data for employment, as suggested by the U.S. EPA and as utilized for previous point source projections approved by U.S. EPA. The point source data provided SIC codes used to determine a short title description that matched the corresponding description found in the BEA data. The application of growth factors for each projection was then used for point sources. *Appendix H* provides information on how point source projections were determined.

#### **Point Source Projections – Jefferson County**

Following established practices, in conformance with applicable EPA regulations and guidance, LMAPCD compiled 2002 or 2003 annual emissions data from all major industrial emission sources subject to local or federal permit requirements. These data were reported and compiled into a database (SAMS). LMAPCD derived from this data listings of annual and summer weekday emissions for all identified point sources in Jefferson County.

Growth factors were developed from a variety of socioeconomic data into tables consistent with past inventory projection methodology used by LMAPCD. Each identified point source was assigned a code for an identified growth indicator (modified APCD BEA codes) pertinent to that source industry (SIC code) or plant. This code was used as an index into a table of growth factors adapted, interpolated and extrapolated by LMAPCD from data originally developed by the



University of Louisville Urban Studies program to represent local growth rates. The 2003 base year inventory was then projected using the growth table into inventories for 2005, 2008, 2011, 2014, 2017, and 2020. VOC and NO<sub>x</sub> are ozone precursors and the pollutants of interest for this demonstration.

Emissions projections for most categories are characteristically flat or slightly rising over the demonstration period. Little attempt was made for this demonstration to show the effect of planned point source controls for most sources. Some exceptions show up in plant-specific growth rates. However, much of the point source NO<sub>x</sub> inventory comes from electric power plants, and cost effective controls are planned or already implemented for power plants in Jefferson County. For this inventory, special growth rates were developed to reflect controls added since 2003 in Louisville Gas & Electric Company's (LG&E's) (recently renamed E.ON US) response to the requirements of the NO<sub>x</sub> SIP call. These controls currently apply, pursuant to the NO<sub>x</sub> SIP Call, only May through September each year (the "high ozone season"), but are thus pertinent to peak ozone season and the inventories for this demonstration. It is noted, however, that the U.S. EPA's Clean Air Interstate Rule (CAIR), which additionally addresses fine particulates, establishes year-round requirements. For this demonstration LMAPCD developed estimated control efficiencies (86%- 89%) from data supplied by LG&E. Emission reduction rates (fractions of 1) were developed into a table by projection year reflecting the initial onset of SCR NO<sub>x</sub> controls at units 3 and 4 of the Mill Creek plant in mid-2004, and additional controls at the Cane Run plant. LG&E supplied supporting tables of projected emission rates and activity levels for the controlled units based on their operations planning and test data. Emission reduction factors were derived from these and multiplied by activity growth

factors assigned to each facility reflecting local estimated utility growth. These composite factors by power plant were used in lieu of the industry average activity growth rates for each plant. The inventory projections show significant overall reductions in NO<sub>x</sub> between 2003 and 2020, and these reductions represent significant fractions of the overall county point source NO<sub>x</sub> inventories. (*See Appendix D*)

#### **Area Source Projections- Bullitt and Oldham Counties**

Area sources can be defined as those sources that are generally too small and/or too numerous to be handled individually in the point source inventory. Emissions are estimated by multiplying an emission factor by a known indicator of collective activity such as number of employees or population. For area source emission projections, population growth factors for each chosen year were calculated using an exponential formula in the EXCEL software. The application of these growth factors for each projection was then used for area sources. Information used to calculate growth factors, including population information used to project area sources was provided by the University of Louisville Urban Data Center and can be found in *Appendix H*.

#### **Area Source Projections – Jefferson County**

For Nonpoint Sources, LMAPCD had to choose between competing candidates for a base year inventory. One choice was the Nonpoint sector 2002 CERR submittal, the other was to update prior LMAPCD inventory methodologies used in 1999 and 2001.

EPA reporting rules required submittal of 2002 area source (nonpoint) emissions inventory data as part of the 2002 National Emissions Inventory (NEI). By interagency agreement, LMAPCD consented to accept VISTAS inventories for the Nonroad sector of that inventory. VISTAS is the

regional agency for the southeast U.S. preparing photochemical models and associated regional inventories to comply with planning and attainment of the visibility standards. VISTAS applied growth factors to selected 1999 data available at the federal level (NEI 1999), and used a variety of regional data and methods to compute other inventory categories. The data was submitted to EPA by VISTAS for the draft 2002 inventory, posted to a website, downloaded and resubmitted (essentially verbatim) for most categories by LMAPCD as part of the NEI 2002 submittal. In February 2005, EPA posted a draft final inventory to a website following QA and possible corrections. LMAPCD downloaded the draft final 2002 NEI Nonpoint data and it was considered as a candidate for a 2002 Nonpoint inventory.

Alternately, LMAPCD had locally prepared earlier area source inventories for reporting to EPA, including 1990, 1993, 1996, and 1999, and a later revision to 2001 for the 1-hour ozone NAAQS redesignation request. LMAPCD considers a locally developed inventory to be highly desirable for this attainment demonstration to facilitate future tracking of progress. Area sources are subject to local variables of geography and culture, and nationally developed methodology might overestimate, underestimate, or overlook sources of peculiar local significance. An attempt was made to match categories of the 2002 NEI inventory (above) to the prior APCD inventories, but the breakdown categories were too dissimilar to make a hybrid approach workable. Still, LMAPCD found it desirable to use projection growth factors compatible with the point source methodology, and the local LMAPCD work met this criterion. In the end, LMAPCD chose to estimate area source inventories using prior local methodologies.

The last available prior locally produced area source inventory was projected to 2003, and then projected again for future years. The last prior LMAPCD area source inventory was prepared in 2001 for the 1-hour ozone attainment demonstration. Each line item on the 2001 inventory included an index (BEA codes) to a table of growth rates consistent with existing point source projection methodology (above). LMAPCD adapted the 2002 projections cited in the 2001 area source inventory as a basis for determining a 2003 inventory. The 2001 methodology was adapted from paper reports into a spreadsheet and results were verified replicable. LMAPCD then identified subcategories of the reported emissions data and assigned indexes to growth factors compatible with the chosen Point Source growth factor methodologies. The 2002 Nonpoint inventory was then grown to produce the base year 2003 and all other projected years for the demonstration.

#### **Non-Highway Mobile Source Projections – Bullitt and Oldham Counties**

The non-highway mobile category is broken down into three groups that include 2 and 4-cycle gasoline engines and diesel engines (other non-highway engines), railroad locomotives, and aircraft. Emissions are estimated by multiplying the base year inventory by a known indicator of collective activity such as fuel consumed or landing/takeoff operations. For locomotive and aircraft emission projections, population growth factors for each chosen year were calculated using the before mentioned formula. The application of these growth factors for each projection was then used for each of these non-highway categories. For other non-highway categories (e.g., industrial equipment, tractors, leaf blowers), the U.S. EPA's nonroad model (Core Model Version 2005a, February 2006) was used to determine the future year projections. Nonroad model and non-highway projection information can be found in *Appendix H*. Updated minimum and maximum summer temperatures and ambient temperatures were utilized for input into the

nonroad model. EPA Volume IV mobile source guidance was followed in determining the updated temperature data. See the baseline inventory in *Appendix D* for specific temperature documentation.

### **Non-Highway Mobile Source Projections – Jefferson County**

EPA reporting rules required submittal of 2002 Jefferson County emissions inventory data as part of the 2002 National Emissions Inventory (NEI). By interagency agreement, LMAPCD accept VISTAS inventories for the Nonroad sector. VISTAS is the regional planning organization (RPO) for the southeast U.S. preparing photochemical models and associated regional inventories to comply with planning and future attainment of national visibility standards. For most Nonroad Mobile categories, the VISTAS contractor (E.H. Pechan & Associates) used the EPA NONROAD model (2002A) to produce county-level nonroad emissions estimates, per EPA guidance. For certain categories, in particular Aircraft, Commercial Marine Vehicles, and Locomotives, the VISTAS contractor applied other documented data sources and methods. The data were submitted to EPA by VISTAS for the draft 2002 inventory, posted to a website, downloaded and resubmitted (essentially verbatim) for most categories by LMAPCD as part of the NEI 2002 submittal. In February 2005, EPA posted a draft final inventory to a website following QA and possible corrections. Notable among the corrections found were significantly lower estimates of PM for commercial aircraft due to change in nationally accepted methodology, and addition of data for Pleasure Craft (boats). LMAPCD downloaded the draft final 2002 NEI Nonpoint data for a candidate 2002 Nonroad Mobile inventory.

LMAPCD acquired the EPA NONROAD 2002A model and the E.H. Pechan documentation of its methodology and assumptions, and eventually was able to replicate the original work as submitted by VISTAS. LMAPCD then acquired the updated 2004 draft, and later the 2005 final EPA NONROAD model and restructured certain model parameters to be consistent with local offroad fuel specifications and local temperatures. The restructured NONROAD 2005 model runs were run for Jefferson County, KY. and compiled into (most categories of) the 2003, 2005, 2008, 2011, 2014, 2017, and 2020 Nonroad Mobile inventories.

LMAPCD separated out the other categories from NEI 2002 not modeled by NONROAD – Aircraft and Locomotives -- into a 2002 subinventory. LMAPCD then identified subcategories of the reported emissions data and assigned indexes to growth factors compatible with the chosen Point Source growth factor methodologies. This 2002 Nonroad subinventory was then grown to produce the base year 2003 and all other projected years for the demonstration.

#### **Highway Mobile Source Projections – Bullitt and Oldham Counties**

To calculate future highway mobile source emissions, the Division obtained data on Daily Vehicle Miles Traveled (DVMT) and speeds for 2002, 2003, 2005, 2008, 2011, 2014, 2017, and 2020 from the Kentucky Transportation Cabinet (*Appendix E*). The Division ran U.S. EPA's MOBILE6.2 model, the latest highway mobile source emission factor estimation modeling software approved by U.S. EPA, to derive appropriate projection year emission factors that were multiplied by the corresponding DVMT to determine the projected highway mobile source emissions. These data and documentation on how these projections were performed can be found in *Appendix E*, including MOBILE6.2 input and output files used to compute the highway mobile source 2002 emissions and subsequent emission projections for 2003, 2005, 2008, 2011,

2014, 2017, and 2020. Baseline inventory documentation in *Appendix D* provides the minimum and maximum summer temperatures were used for the highway mobile source calculations. Table 11 contains the motor vehicle emissions budget for the Bullitt, Oldham, and Jefferson Counties 8-hour ozone nonattainment area for the year 2020.

### **Highway Mobile Source Projections –Jefferson County**

For SIP inventories and transportation conformity analysis, LMAPCD maintains a capacity to apply the EPA MOBILE model to estimate onroad mobile source emissions. By interagency agreement, LMAPCD and the Kentuckiana Regional Planning and Development Agency (KIPDA) periodically cooperate to produce onroad emissions estimates for Louisville and the surrounding counties in the ozone nonattainment area (Jefferson, Clark, Floyd, Bullitt and Oldham counties). KIPDA maintains a travel demand model (TDM) to estimate transportation system capacities, speeds, and vehicle miles traveled (VMT) in the five counties surrounding Louisville. Consistent with EPA guidance and interagency consultation, LMAPCD applies various planning assumptions about control programs in multiple jurisdictions, fuel, and environment specifications to the MOBILE6 model to produce tables of emission factors in grams per mile by subcategories of county, facility type, road speed, and scenario year. KIPDA and LMAPCD share this information such that either can subsequently estimate emissions by multiplying link, facility, or countywide VMT data with matched emission factors appropriate to each category.

For this demonstration, by interagency agreement LMAPCD adapted recently available KIPDA VMT data and LMAPCD emission factors developed in September 2005. At that time KIPDA conducted transportation conformity analysis for Louisville for years 2002, 2009, 2012, 2020,

and 2030. That analysis was publicly reviewed and the conformity determination based upon it was federally approved. No significant changes have since occurred to consensus planning assumptions, and this work readily provides VMT data suitable for most inventory years of this demonstration. By interagency agreement, KIPDA provided additional TDM work to derive specific VMT data for 2003. VMT for other years can be taken directly (2020) or between TDM years from the recent conformity work. LMAPCD applied the MOBILE6 model directly to estimate emission factors for each specific inventory year reported (EFs not interpolated). LMAPCD has compiled the top-down estimates of countywide 2003 and projected emissions into a spreadsheet. Jefferson County estimates from that work are reported as inventories for this demonstration. By agreement, the same LMAPCD work supports emission factors and totals used by Indiana in its portion of the demonstration pertinent to Clark and Floyd Counties. By agreement, Bullitt and Oldham County inventories are provided by the State of Kentucky for this demonstration, using independent methodology.

**TABLE 6**  
**BULLITT, OLDHAM, AND JEFFERSON COUNTIES 8-HOUR OZONE MAINTENANCE AREA**  
**HIGHWAY MOBILE SOURCE PROJECTED EMISSIONS**  
**(TONS PER DAY)**  
**2003-2020**

<b>POLLUTANT</b>	<b>2003</b>	<b>2005</b>	<b>2008</b>	<b>2011</b>	<b>2014</b>	<b>2017</b>	<b>2020</b>
VOC	31.37	28.63	23.88	19.57	15.99	14.10	12.91
NO <sub>x</sub>	75.24	66.55	51.12	37.33	25.94	19.00	15.47
CO*	384.09	349.43	280.79	246.06	222.41	211.75	208.19

\*DOES NOT APPLY TO MOBILE BUDGETS

#### **TOTAL OF ALL EMISSIONS**

It is important to recognize the differences between the 2003-tpd levels and the projected tpd levels for each pollutant for the year 2020. Table 9 shows that Bullitt, Oldham, and



Jefferson Counties's projected 2020 emissions for all pollutants are less than the 2003 attainment year emissions. This demonstrates continued maintenance of emissions that have been linked to attainment of the 8-hour ozone standard.

**TABLE 7**  
**BULLITT AND OLDHAM COUNTIES 8-HOUR OZONE MAINTENANCE AREA**  
**2002 – 2003 – 2020 EMISSIONS COMPARISONS**  
**TOTAL EMISSIONS (TONS PER DAY)**

SOURCE CATEGORY	2002			2003			2020		
	VOC	CO	NO <sub>x</sub>	VOC	CO	NO <sub>x</sub>	VOC	CO	NO <sub>x</sub>
POINT	8.33	0.18	0.57	8.10	0.25	0.67	9.16	0.30	0.80
AREA	5.71	2.20	0.18	5.80	2.26	0.18	7.58	2.89	0.23
HIGHWAY MOBILE	5.91	72.50	11.84	6.03	72.57	11.95	3.39	50.73	4.45
NON-HWY MOBILE	3.28	28.23	3.44	3.31	28.98	3.44	2.44	36.26	2.22
<b>TOTAL EMISSIONS</b>	<b>23.23</b>	<b>103.11</b>	<b>16.03</b>	<b>23.24</b>	<b>104.06</b>	<b>16.24</b>	<b>22.57</b>	<b>90.18</b>	<b>7.70</b>

**TABLE 8**  
**JEFFERSON COUNTY 8-HOUR OZONE MAINTENANCE AREA**  
**2003 – 2020 EMISSIONS COMPARISONS**  
**TOTAL EMISSIONS (TONS PER DAY)**

SOURCE CATEGORY	2002			2003			2020		
	VOC	CO	NO <sub>x</sub>	VOC	CO	NO <sub>x</sub>	VOC	CO	NO <sub>x</sub>
POINT	23.62	9.81	74.76	23.63	9.83	74.78	22.74	9.53	46.49
AREA	17.30	1.13	0.75	17.33	1.13	0.75	17.85	1.05	0.76
HIGHWAY MOBILE	26.83	335.08	66.33	25.34	311.52	63.29	9.52	157.46	11.02
NON-HWY MOBILE	14.57	186.77	32.00	14.31	191.10	31.94	10.64	233.89	22.17
<b>TOTAL EMISSIONS</b>	<b>82.32</b>	<b>532.79</b>	<b>173.84</b>	<b>80.61</b>	<b>513.58</b>	<b>170.76</b>	<b>60.75</b>	<b>401.93</b>	<b>80.44</b>

**TABLE 9**  
**KENTUCKY 8-HOUR OZONE MAINTENANCE AREA**  
**2003 – 2020 EMISSIONS COMPARISONS**  
**TOTAL EMISSIONS (TONS PER DAY)**

SOURCE CATEGORY	2002			2003			2020		
	VOC	CO	NO <sub>x</sub>	VOC	CO	NO <sub>x</sub>	VOC	CO	NO <sub>x</sub>
POINT	31.95	9.99	75.33	31.73	10.08	75.45	31.90	9.83	47.29
AREA	23.01	3.33	0.93	23.13	3.39	0.93	25.43	3.94	0.99
HIGHWAY MOBILE	32.74	407.58	78.17	31.37	384.09	75.24	12.91	208.19	15.47
NON-HWY MOBILE	17.85	215.00	35.44	17.62	220.08	35.38	13.08	270.15	24.39
<b>TOTAL EMISSIONS</b>	<b>105.55</b>	<b>635.90</b>	<b>189.87</b>	<b>103.85</b>	<b>617.64</b>	<b>187.00</b>	<b>83.32</b>	<b>492.11</b>	<b>88.14</b>

## PLAN TO MAINTAIN AIR QUALITY

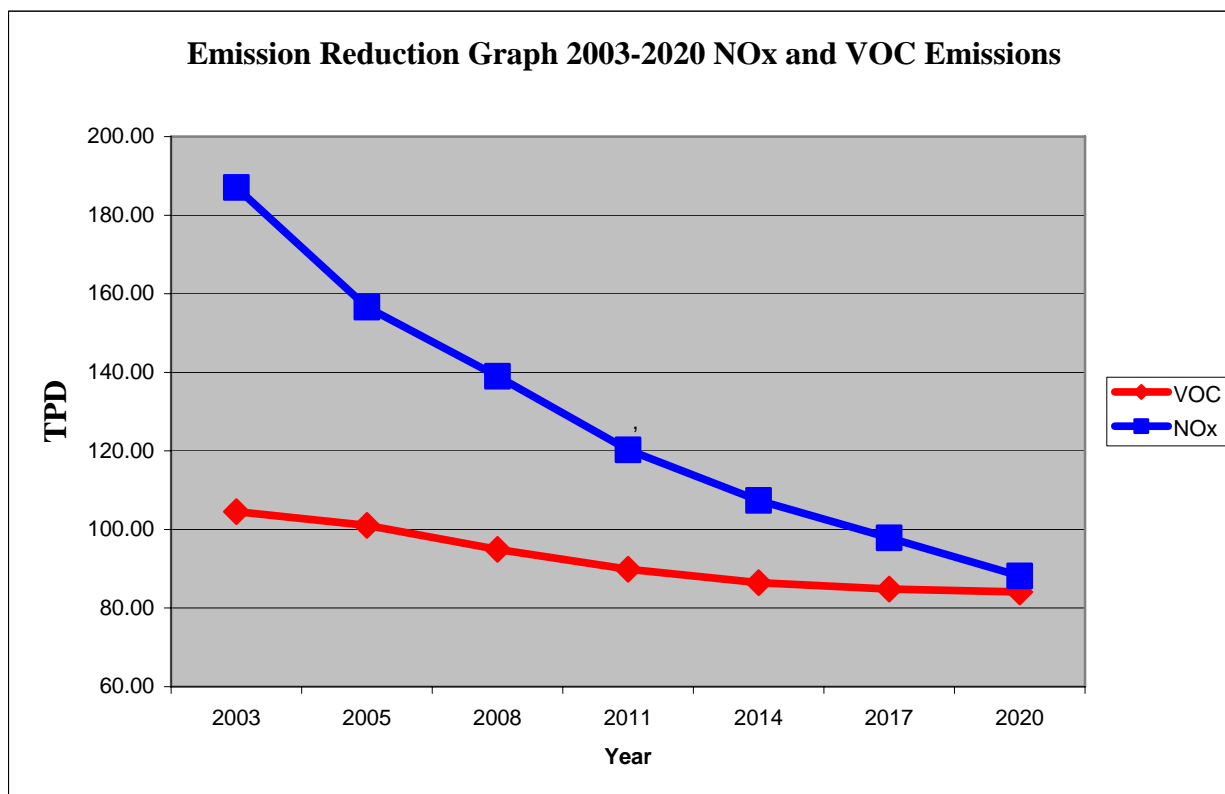
The Commonwealth of Kentucky and U.S. EPA have instituted programs that will remain enforceable and are hereby submitted as a plan to maintain air quality which meets the NAAQS for the 8-hour ozone standard. Sources are prohibited from reducing emission controls following the redesignation of the area.

- ☞ All new major VOC or NO<sub>x</sub> sources locating in Kentucky shall as a minimum apply control procedures that are reasonable, available, and practical;
- ☞ All major modifications to existing major VOC or NO<sub>x</sub> sources are subject to RACT requirements as well as the BACT requirement of the DAQ and LMAPCD PSD regulations;
- ☞ All new effected facilities with the potential to emit more than 5 tons per year of VOC are required to have best available control technology (BACT) Jefferson County – Regulation 7.25 *Standard of Performance for New Sources Using Volatile Organic Compounds*;
- ☞ Continuation of the rule effectiveness programs to enhance inspection of stationary sources to ensure emission control equipment is functioning properly and compliance is maintained (Jefferson County);
- ☞ Stage I Vapor Recovery in the former 1-Hour Maintenance portions of Bullitt and Oldham Counties;
- ☞ Requirement for Stage II Vapor Recovery (Jefferson County);
- ☞ Federal Motor Vehicle Control Standards apply in Kentucky;

- ✧ LMAPCD Amended Board Order with the Kosmos Cement Company to comply with an allowed emission rate for the cement kiln that is more stringent than the previous Kentucky SIP NO<sub>x</sub> RACT limit;
- ✧ Reformulated Gasoline Phase II in effect in Jefferson County and the former 1-Hour Maintenance portions of Bullitt and Oldham counties since January 1, 2000;
- ✧ Transportation conformity;
- ✧ Prevention of Significant Deterioration requirements;
- ✧ Federal Controls on certain nonroad engines (e.g. diesel and other fuel requirements, industrial diesel equipment, locomotives) after 2000;
- ✧ Federal controls on the VOC content for Architectural and Maintenance Paints, Auto Body Shops, and Consumer Products;
- ✧ The state open burning regulation to further limit types of burning in the former 1-Hour Maintenance portions of Bullitt and Oldham Counties.

In addition to these measures, further reductions will be achieved throughout the continued implementation of new federal regulations to further control the emission of Hazardous Air Pollutants that are VOCs (40 *Code of Federal Regulations* 63, NESHAPS). Also, on March 10, 2005, the U.S. EPA finalized the Clean Air Interstate Rule (CAIR). NO<sub>x</sub> emissions from power plants will be cut by 1.7 million tons by 2009 and emissions will be reduced by 1.3 million tons in 2015 in 28 eastern states and the District of Columbia. These reductions cannot be quantified at this time, but will be reflected in future assessments.

**Graph 7**



## **EXISTING MONITORING NETWORK**

In addition to the maintenance plan discussed above, the existing ozone monitors located within the Kentucky counties of the Louisville 8-Hour Ozone nonattainment area has been approved by the U.S.EPA. The monitors will continue to remain operational in accordance to 40 CFR 58.

## **CONTINGENCY MEASURES**

Future reviews of actual emissions for this redesignated area will be performed using the latest emission factors, models, and methodologies. For these periodic inventories, the Commonwealth will review the assumptions made for the purpose of the maintenance

demonstration concerning projected growth of activity levels. If any of these assumptions appear to have changed substantially, the Commonwealth will re-project emissions.

In the event that a measured value of the fourth highest maximum is 0.87 ppm or greater in any portion of the maintenance area in a single ozone season, or if periodic emission inventory updates reveal excessive or unanticipated growth greater than 10% in ozone precursor emissions, the state will evaluate existing control measures to see if any further emission reduction measures should be implemented at that time.

In the event of a monitored violation of the 8-hour ozone NAAQS standard in the Louisville maintenance area, the Commonwealth, or, as appropriate, LMAPCD commits to adopt, within nine months, one or more of the following contingency measures to re-attain the standard. All regulatory programs will be implemented within 18 months.

- ✓ Implementation of a program to require additional emission reductions on stationary sources;
- ✓ Implementation of a program to enhance inspection of stationary sources to ensure emission control equipment is functioning properly;
- ✓ Implementation of fuel programs, including incentives for alternative fuels;
- ✓ Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high-occupancy vehicles;
- ✓ Trip-reduction ordinances;
- ✓ Employer-based transportation management plans, including incentives;
- ✓ Programs to limit or restrict vehicle use in downtown areas, or other areas of emission concentration, particularly during periods of peak use;
- ✓ Programs for new construction and major reconstructions of paths or tracks for use by pedestrians or by non-motorized vehicles when economically feasible and in the public interest.
- ✓ Re-implementation by LMAPCD of a vehicle inspection/maintenance (I/M) program. The following milestones are applicable to this contingency measure and are measured from the date of notification of a new violation:
  - ✓ Proposal of draft regulations and promulgation of final regulations – 3 months ;
  - ✓ Issuance of final specifications and procedures – 3 months;
  - ✓ Issuance of final Request for Proposals (if applicable) – 4 months;
  - ✓ Licensing or certifications of stations and inspectors – 17 months.

The Commonwealth also reserves the right to implement other contingency measures if new control programs should be developed and deemed more advantageous for the area.

Section 175A(b) of the Clean Air Act requires that eight years after formal redesignation, the state continues to provide for maintenance of the standard for an additional ten years. If this requirement remains applicable for this area, the Commonwealth commits to submit to U.S. EPA a plan for future maintenance of the standard in Bullitt and Oldham Counties as required.

### **REGIONAL MOBILE SOURCE BUDGETS FOR TRANSPORTATION CONFORMITY**

The DAQ, LMAPCD, IDEM, KIPDA, and other agencies involved in the transportation conformity process have agreed with continuing the approach of maintaining regional mobile source emissions budgets.

The transportation conformity regulation, 40 CFR part 93 subpart A *Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Laws*, requires that mobile source emissions submitted or approved to a state's SIP be used in determining conformity of transportation plans for the area. This regulation also allows the addition of a safety margin to the mobile emissions budgets. Per the 40 CFR 93.101, the safety margin is defined as "the amount by which the total projected emission from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment or maintenance. Table 10 shows a summary of the 2003 attainment year and the 2020 out year emissions, and the corresponding safety margin.

**Table 10**  
**Summary of Regional Emissions**  
**(TPD)**

	<b>2003</b>	<b>2020</b>	<b>Safety Margin</b>
Kentucky VOC	103.85	83.32	20.53
Indiana VOC	29.26	27.65	1.61
<b>VOC Total</b>	<b>133.11</b>	<b>110.97</b>	<b>22.14</b>
Kentucky NOx	187.00	88.14	98.86
Indiana NOx	51.77	38.11	13.66
<b>NOx Total</b>	<b>238.77</b>	<b>126.25</b>	<b>112.52</b>

A portion of the available safety margin is being assigned to the motor vehicle emissions budget, which is detailed in Table 11 below.

**Table 11**  
**Louisville KY-IN 8-Hour Maintenance Plan**  
**Regional Motor Vehicle Emissions Budget (TPD)**

	<b>2020</b>
VOC	22.92
NOx	29.46

After allocation of a portion of the available safety margin to the motor vehicle emissions budget, the remaining safety margin for VOC is 5.25 TPD and for NOx is 92.90 TPD.

## **PUBLIC PARTICIPATION**

Kentucky and LMAPCD jointly conducted a public hearing to receive comments on this proposed SIP revision to redesignate the Kentucky portion of the Louisville KY-IN 8-Hour Nonattainment Area on July 19, 2006, at the boardroom of the LMAPCD, 850 Barret Street, Louisville, Kentucky. A copy of the public hearing notice and a copy of the advertisement is included in *Appendix I*.

A copy of the Environmental and Public Protection Cabinet's responses to comments received during that public review period is included as *Appendix J*.



## **APPENDIX SUMMARY**

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**APPENDIX A – *FEDERAL REGISTER*, VOL. 69, NO. 84, APRIL 30, 2004, “AIR QUALITY DESIGNATIONS AND CLASSIFICATIONS FOR THE 8-HOUR OZONE NAAQS”**

**APPENDIX B – USEPA MEMORANDUM FROM JOHN CALCAGNI, JUNE 23, 1992, “SUBJECT: PROCESSING OF SIP SUBMITTALS,” AND USEPA MEMORANDUM FROM JOHN CALCAGNI, SEPTEMBER 4, 1992, “SUBJECT: PROCEDURES FOR PROCESSING REQUESTS TO REDESIGNATE AREAS TO ATTAINMENT,” AND USEPA MEMORANDUM FROM MICHAEL H. SHAPIRO, SEPTEMBER 17, 1993, “SIP REQUIREMENTS FOR AREAS SUBMITTING REQUESTS FOR REDESIGNATION TO ATTAINMENT OF THE OZONE NAAQS ...”**

**APPENDIX C – AQS/USEPA DATABASE, “BULLITT AND OLDHAM COUNTIES AMBIENT 8-HOUR OZONE DATA FOR 2002 THROUGH 2005”**

**APPENDIX D – 2002 BASELINE EMISSIONS INVENTORY METHODOLOGY AND DOCUMENTATION, AND APPENDICES A THROUGH F**

**APPENDIX E – MOBILE MODEL RUNS AND DOCUMENTATION**

**APPENDIX F – 401 KAR 50:012 RACM**

**APPENDIX G – NON-HIGHWAY MOBILE RUNS**

**APPENDIX H – EMISSIONS PROJECTIONS INVENTORY METHODOLOGY AND DOCUMENTATION**

**APPENDIX I - NOTICE OF PUBLIC HEARING AND LEGAL DOCUMENTATION**

**APPENDIX J – STATEMENT OF CONSIDERATION**

**APPENDIX K – MONITOR LOCATIONS**